EXTECH INSTRUMENTS

User's Manual

Hygro Thermo-Anemometer + Type K/J Thermometer

Model 407412A

Introduction

Congratulations on your purchase of Extech's Hygro Thermo-Anemometer. This Heavy Duty meter measures and displays Air Velocity + Temperature, Relative Humidity + Temperature and Type K/J Temperature. Air flow can be displayed in the following units of measure: feet per minute, meters per second, miles per hour, kilometers per hour, and knots. Temperature and RH units are displayed in °C/°F and % units respectively. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

Meter Description

1. Type K/J thermocouple input plug
2. Sensor input plug – The Anemometer sensor and the Humidity sensor use the same jack at the top of the meter.
3. LCD Display
4. Keypad (see below)

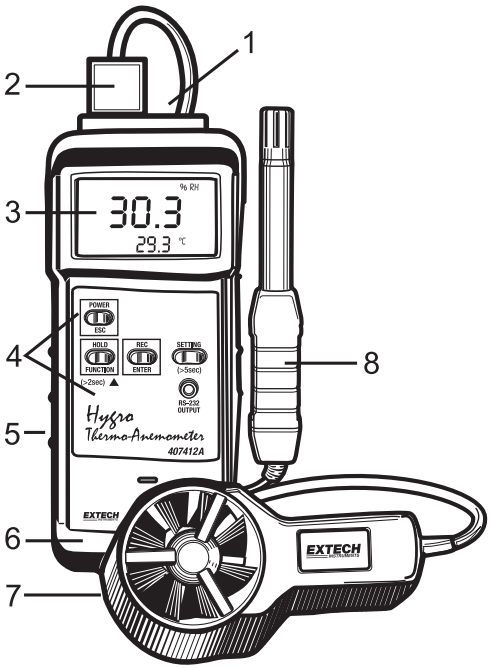
   POWER Press to turn the meter ON or OFF

   HOLD/FUNCTION Press to freeze the currently displayed reading/Selects unit in setup mode; selects Probe (left position) or Thermocouple (right position)

   REC/ENTER Press to track the MAX and MIN readings/Press to enter selection in setup mode

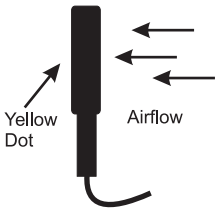
   SETTING Press to enter setup mode

   RS-232 Serial interface jack
5. Battery compartment and tilt sand are located on the back of the meter
6. Rubber protective jacket
7. Vane Anemometer sensor
8. Humidity sensor



Anemometer and Temperature Operation

1. Insert the Vane sensor into the meter's input jack at the top of the meter.
2. Press the POWER button to turn the instrument on and it will automatically recognize the connected probe.
3. The Air Velocity display will default to the settings when the unit was last powered off.
4. To change settings, refer to the Setup Mode described below.
5. For maximum accuracy, the yellow dot must be on the exhaust side of the vane as shown.
6. The meter's LCD will indicate Air Velocity + Temperature.



Setup Mode

Press and Hold the SETTING button for >5 seconds to enter setup mode. Use the SETTING Button to select the function listed below. To select the desired unit, press the FUNCTION button. Press the ENTER button to store the selection. Momentarily press the POWER button to exit the setup mode.

1. **Unit**: Changes the air velocity measurement unit (m/s, km/hr, ft/min, knots, & mile/h). Anemometer probe only.

2. **K**: Changes the thermocouple type (K or J). Thermocouple probe only.

3. **°C:** Changes the temperature unit of measure (°C or °F). Anemometer, Humidity, and Thermocouple probes.

4. **OFF:** Auto Power Off control (Yes/No). Anemometer, Humidity, and Thermocouple probes.

5. **Code:** Code entering for factory calibration.

Relative Humidity and Temperature Operation

1. Insert the Relative Humidity probe in the input jack at the top of the meter.
2. Press the POWER button to turn on the instrument and it will automatically recognize the connected probe.
3. The Humidity mode of operation will default to the settings when the unit was last powered off.
4. To change the temperature units of measure, refer to the Setup Mode described in the previous section of this manual.
5. Hold the probe by the handle in the area to be monitored. The meter will display Relative Humidity + Temperature.
6. Note that humidity measurements take several minutes to stabilize.

Type K/J Temperature Operation

1. Insert the thermocouple into the meter's thermocouple input jack at the top of the meter.
2. Press the POWER button to turn the instrument on and it will automatically recognize the connected probe.
3. The Air Velocity display will default to the settings when the unit was last powered off.
4. To change settings, refer to the Setup Mode described in the previous section of this manual.

Note: The Thermocouple probe can be inserted into the meter at the same time as the Anemometer or RH/Temperature probe. To alternate between the inserted probes, press and hold the FUNCTION button for more than 2 seconds.

Data Hold

Press the HOLD button to freeze the displayed reading. The HOLD icon will appear on the LCD while Data Hold is engaged. Press the HOLD button again to resume normal operation.

Min/Max Record Mode

When selected, the Record mode stores the highest (Max) and lowest (Min) readings for later recall. To use Record mode:

1. Press the REC button. The REC indicator will appear on the LCD display.
2. Start a measurement session.
3. After the measurement session, press the REC button to view the highest (Max) reading recorded. The MAX indicator will appear to inform the user that the displayed reading is the highest value recorded. Momentarily press the HOLD button to continue recording.
4. Press the REC button again to view the lowest reading. The MIN indicator will appear on the LCD to inform the user that the reading displayed is the lowest value recorded. Momentarily press the HOLD button to continue recording.
5. Press and Hold the REC for 2 seconds to return the meter to normal operation. All stored data will be cleared and the REC/MIN/MAX icons will disappear from the LCD.
6. Note that putting the meter into the Record mode defeats the Auto Power Off feature.

RS-232 PC Interface

The RS-232 serial data port (3.5mm phono jack) is located on the face of the meter. The PC interface hardware is intended for use with the Extech Data Acquisition software package, Part Number 407001 which includes Windows™ 95 / 98 / ME / NT / 2000/ XP compatible software and PC interface cable. For more information, contact Extech or refer to the 407001 User's Manual.

Auto Power Off feature

The Auto Power Off feature automatically turns the meter off after approximately 10 minutes. This feature can be defeated in Setup Mode described in a previous section of this manual.

Battery Replacement

When it is time to replace the 9V battery, the low battery indicator appears in the top left-hand corner of the LCD display. Note that reliable readings can be obtained for several hours after the first appearance of the low battery indicator.
To replace the battery:

1. Remove the meter's protective rubber holster.
2. Open the battery compartment on the back of the meter using a small coin or a flat blade screwdriver.
3. Replace the 9V battery, close the compartment, and replace the holster.

Specifications

General Specifications

Display	Dual function, 4-digit (9999 count) LCD display
Units of measure	m/s (meters per second), km/hr (kilometers per hour), ft/min (feet per minute), knots (nautical miles per hour), mile/hr (miles per hour); Temperature: °C/°F; Humidity: %RH
Data hold	Holds reading on the LCD display when button is pressed
Sensors	Air velocity sensor: Twisted vane arm with low friction ball bearing; Temperature: Precision thermistor; Humidity: Thin film capacitor; Temperature: Type K/J thermocouple
Max/Min Record	Records highest and lowest readings for later recall
Data Output	RS-232 serial PC interface
Operating Temp.	32°F to 122°F (0°C to 50°C)
Operating Humidity	Max. 80% RH
Power Supply	9V battery
Power Consumption	Approx 11mADC (Anemometer); 7mADC (RH); 6mADC (Type K/J)
Weight	0.77 lbs. (350g)
Dimensions	Meter: 7.1x2.8x1.3" (180 x 72 x 32mm); Anemometer Probe: 2.8" (72mm) Diameter x 5.5" (140mm)
Accessories	Anemometer/temperature and RH Probes, 9V battery, & case

Range Specifications

Air velocity

Measurement	Range	Resolution	Accuracy (% of reading)
ft/min (feet/min)	80 - 4930 ft/min	1 ft/min	± (2% + 40 ft/min)
m/s (meters/sec)	0.4 - 25.00 m/s	0.01 m/s	± (2% + 0.2 m/sec)
km/h (kilometers/hour)	1.4 - 90.0 km/h	0.1 km/h	± (2% + 0.8 km/hr)
mph (miles/hour)	0.9 - 55.9 mph	0.1 mph	± (2% + 0.4 mph)
knots (nautical miles/hour)	0.8 to 48.6 knots	0.1 knots	± (2% + 0.4 knots)

Temperature

Range	Resolution	Accuracy
32°F to 122°F (0°C to 50°C)	0.1°F/°C	±1.5°F (±0.8°C)

Relative Humidity

Range	Resolution	Accuracy
10 to 70% RH	0.1%	±3% RH
70 to 95% RH	0.1%	±(3% rdg ±1%RH)

Thermocouple Temperature

Range	Resolution	Accuracy
Type K		
-58°F to 2372°F (-50°C to 1300°C)	0.1°F/°C	± (0.4% + 1.5°F (±0.8°C))
-327°F to -58°F (-199°C to -50°C)	0.1°F/°C	± (0.4% + 1.8°F (±1°C))
Type J		
-58°F to 2012°F (-50°C to 1100°C)	0.1°F/°C	± (0.4% + 1.5°F (±0.8°C))
-327°F to -58°F (-199°C to -50°C)	0.1°F/°C	± (0.4% + 1.8°F (±1°C))

Appendix

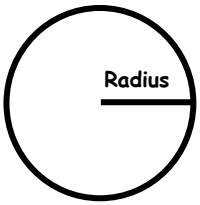
Area equation for rectangular or square ducts

Height (H)

Width (W)

Area (A) = Width (W) x Height (H)

Area equation for circular ducts



Area (A) = ⑥ x r^2
Where ⑥ = 3.14 and r^2 = radius x radius

Cubic equations

CFM (ft^3/min) = Air Velocity (ft/min) x Area (ft^2)
CMM (m^3/min) = Air Velocity (m/sec) x Area (m^2) x 60

NOTE: Measurements made in *inches*
must be converted to *feet* or *meters* before using the above formulae.

Unit of Measure Conversion Table

	m/s	ft/min	knots	km/h	MPH
1 m/s	1	196.87	1.944	3.6	2.24
1 ft/min	0.00508	1	0.00987	0.01829	0.01138
1 knot	0.5144	101.27	1	1.8519	1.1523
1 km/h	0.2778	54.69	0.54	1	0.6222
1 MPH	0.4464	87.89	0.8679	1.6071	1

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Support Lines: U.S. (877) 439-8324; International: +1 (603) 324-7800

Technical Support: Option 3; E-mail: support@extech.com

Repair & Returns: Option 4; E-mail: repair@extech.com

Product specifications are subject to change without notice

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